

Dr. Goldsmith is director of the graduate program in health services administration, Division of Health Administration, Columbia University School of Public Health. He gave an earlier version of this paper entitled "A New Look at the Development of Outcome Indicators in Health Program Evaluation" at the 100th annual meeting of the American Public Health Association in Atlantic City, N.J., on November 16, 1972.

Tearsheet requests to Dr. Seth B. Goldsmith, Graduate Program in Health Services Administration, Columbia University School of Public Health, 600 West 168th St., New York, N.Y. 10032.

A Reevaluation of Health Status Indicators

SETH B. GOLDSMITH, ScD

THIS PAPER IS LARGELY an updating, summary, and elaboration of certain sections of my earlier paper entitled "The Status of Health Status Indicators" (1).

Most papers on health indicators begin with a restatement of the World Health Organization's definition of health—"Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease

and infirmity" (2). Clearly, this is an interesting but not a very operational definition; that is, one has great difficulty using it as a measurement criterion. What, for example, is social well-being? How do we measure it?

Other Definitions

Other equally interesting and unoperational definitions have also been offered throughout the

years, such as Hoyman's definition, "Health is optimal personal fitness for full, fruitful and creative living" (3); Romano's definition, "Health consists in the capacity of the organism to maintain a balance in which it may be reasonably free of undue pain, discomfort, disability or limitation of action including social capacity" (4); Blum's modification of Romano's definition, "Health consists of: 1) the capacity of the organism to maintain a balance appropriate to its age and social needs in which it is reasonably free of gross dissatisfaction, discomfort, disease, or disability; and 2) to behave in ways which promote the survival of the species as well as the fulfillment or enjoyment of the individual" (4); and finally, Sigerist's statement and definition, "We all live in a specific rhythm, determined by nature, culture, and habit. Day and night alternate in an unebbing flow, and we ourselves conform to this rhythm with waking and sleeping . . . with work and rest. . . . An undisturbed rhythm means health. . . . Disease then strikes abruptly into this structure" (5).

Recently some interesting work has been done in the area of definitions by Patrick and Bush (6) at the University of California Medical School at San Diego. These researchers have postulated that "health can be defined as a composite of an individual's level of function at a point in time and his expected transition to other levels, more or less favorable, at future times." They are developing various categories of functional status and prognosis which, when combined, define a given health level at a given time. They are attempting to delineate in a quantitative manner "what

states of being are healthier than others" (6a) by getting judges to classify 29 different function levels into a scale of perfect health to death.

Legal Definitions

Finally, attention should be accorded an often neglected definitional area—the legal definition of health. Court-rendered definitions of health have profound operational implications; a court's interpretation of health can grant or deny jurisdiction to a health department or agency, deny or award claims for insurance and injuries, close down businesses, and enforce warranty provisions. In 1852, for example, the North Carolina Supreme Court noted in *Bell v. Jeffreys* (7) that: "In its ordinary usage, healthy means free from disease or bodily ailment, or a state of the system peculiarly susceptible or liable to disease or bodily ailment." But the court said that when you add the word "sound" to "healthy," you mean "whole, right, nothing the matter with it, [and] free of any defect." In this case the plaintiff was attempting to recover damages that he had sustained through the purchase of a female slave who was supposed to be "sound and healthy" but was myopic. The nearsightedness, the plaintiff claimed, precluded the slave from performing "the common and ordinary business in the house or field, which slaves are taught and expected to perform and which is usually required of them" (7).

The issue of health again came before the North Carolina Supreme Court in 1857 when a person, after buying a slave who was warranted to be "sound in mind and body" found that the

slave had a "contraction of the little finger of each hand" (8). The contraction, the owner argued, made the slave less than healthy and justified the awarding of damages to the plaintiff. After three pages of opinion that interpreted health, heal, and sound by quoting from a variety of regular and medical dictionaries, the court decided that although the contracted fingers did make the slave somewhat less than useful and therefore somewhat less than healthy, the basic warrant was not broken.

The modern legal definition was first stated in 1928 by the West Virginia Supreme Court of Appeals in *Venerable v. Gulf Taxi Line* (9). The court said, "Health means the state of being hale, sound or whole in body, mind, soul or well-being." This legal definition is not very far removed from the North Carolina court's definitions of the 1850's or the World Health Organization's definition in the 20th century.

In concluding this section, I would like to restate the point that I tried to make in my previous paper; that is, these definitional difficulties should not be considered lightly. Just as the inability to define the objectives of any program or organization leads to a problem in measuring the success of the program or organization, the inability to define health leads to the obvious problem of not being able to measure health status. This difficulty of conceptualizing health is one of the major constraints on the development and usefulness of health status indicators.

Costs, Sources, Validity

Other problems that also act as real constraints are cost, data

sources and, of course, validity and reliability. The major work on validity and reliability has been done at the National Center for Health Statistics by Sullivan. In his monograph, "Conceptual Problems in Developing an Index of Health" (10), it was demonstrated that there were considerable problems with the reliability and validity of the National Health Survey. Another report that was particularly interesting in this regard was the 1970 Meltzer and Hochstim paper on the reliability and validity of physical health data collected in the Alameda County, Calif., study directed by Dr. Lester Breslow, dean of the School of Public Health, University of California at Los Angeles (11). Basically, after comparing the data accumulated from household surveys with the clinical data available at the Kaiser clinics, the authors found what appeared to be a low validity level.

The problem with source data is perhaps best exemplified by some early findings of the Association of State and Territorial Health Officers (12), which showed that the various State health departments not only did not collect the same type of data for similar programs, but also that they used a variety of age breakdowns in collecting the data.

Finally, there is the question of costs; interviews, surveys, and staff and computer time are expensive, particularly if the reasons for collecting the data and how they are to be used are not clearly established.

Regardless of these constraints, health administrators and planners are in the real world where real indicators are needed for a host of reasons. More specifi-

cally, indicators are needed to help in the acquisition, allocation, and evaluation of fiscal and human resources. This means we need indicators that can be understood by the public and its legislative representatives, indicators that planners can use to assess needs, and finally, indicators that administrators can use to manage health systems more effectively.

Evaluation Criteria

Presently we have a number of indicators, such as infant mortality and a host of morbidity rates. The arguments over the value of these indicators are practically endless and certainly could fill numerous books. Rather than argue the merits and limitations of the various indicators, many of which are based on subjective assessments, I would like to focus attention on the area of evaluation criteria for health status indicators. In my earlier paper I attempted to synthesize in eight basic criteria the many ideas that have been proposed over the past years. My suggested criteria were these (1a):

- The purpose of the health status indicator should be clearly stated. For example, is the health status indicator meant to be used for public information purposes, program priorities, or what?
- The numerator and denominator data used to compute the index should be readily understandable not only by those who will use the indices, for example planners, but by those who will supposedly be influenced by the index, for example legislators.
- The data used for computation must be presently available from existing data sources with minimal modifications.
- The process of computing

the data must be readily understood by those who will be using the data.

- The components of the index must be clearly identifiable and their individual effects on the total index must be distinguishable.
- The data used in the index must be reliable and valid.
- There must be a built-in mechanism to evaluate the validity of the measure by correlating measures of health status with other measures of social well-being.

These criteria provide a basic framework against which most health indicators can be evaluated. Unfortunately, when one attempts to evaluate indicators against these or similar criteria, the results are somewhat disappointing (13).

The question usually asked now is, What's new and applicable? Unfortunately, the answer is "not much." Clearly, the work I have described earlier—Miller's Q index (14), the risk profiles being generated from the Mount Sinai CINCH work (15), the 1969 Kisch proxy measure (16), the work of Sanders on the productive man-years concept (17), the Northeast Ohio Regional Medical Program Index (18), Chiang's index (19), Sullivan's general index (20), and Fanshel and Bush's work (21)—are all important attempts at developing status indicators. But each has serious deficiencies that limit its usefulness at present (1b).

New Concepts

Although since my last paper no major breakthroughs have come to my attention, there is some new interesting work that is now in various developmental stages. At the National Center

for Health Services Research and Development, Chen is working on an index that is derived from "a norm based on physicians' subjective evaluations. It is a multi-dimensional concept of health: each dimension is measured and . . . combined by transforming them into standard scores [that are matched against norms] based on standards for age, sex, and culture. By assigning different weights and using multivariate analysis" [criteria for correlation can be predicted] (22). A second index that Chen has developed is based on Miller's Q and is Chen's G index (23). Basically, Chen's index is a good attempt at estimating the gross impact of disease on different population groups. While it has not been field tested to date, and the problems of validity and reliability still exist, it still is worth attention and may, in the future, prove quite useful.

Miller is working on performance indices for community health programs and optimizing service tradeoffs. He has continued to be active in this area of health services research. His project called MOST (methodology for optimizing service tradeoffs) applies the systems approach in an attempt to utilize operations research techniques to build a model of the health system with the objective of providing "management with a resource capable of estimating the amounts and placements a) of a fixed budget to maximize health care delivery, or b) to minimize a budget to provide a specified level of care" (unpublished report, "MOST—Model for Optimizing Service Trade-Offs," by J. E. Miller).

His other work uses generally available data to develop for-

mulas for evaluating the effectiveness of preventive, control, and curative health programs (24). Conceptually, the approach used by Miller is similar to that of the Q index, but with certain interesting nuances. For example, in the "P" preventive program formula, a transfer coefficient is used. This factor, the number of people who are in a given disease state divided by the population at risk for the disease, is also used in a more refined state by Bush as transitional probabilities. At the present state of development, Miller's work would seem most applicable for decision-making about a well-delineated homogenous population group.

Since my last report, the Wisconsin survey data have become available (25). In this study health planners were asked to review a list of more than 150 health and health-related indicators and to judge the importance for decision making of each indicator. The data that the planners considered most useful were rates for preventable deaths, mortality rates by major causes, incidence of major diseases, and health facilities data. In lower but also important categories were such popular indicators as the death rate and the infant mortality rate. At the low end of the scale were other popular indicators such as prematurity rate, acute conditions requiring one or more days in bed, and incidence of disabilities by type.

The final study I would like to report on is my investigation of the opinions of State legislators about the importance of health indicators in the decisions these legislators made about the allocation of resources for health programs. In this exploratory study I sent a questionnaire to the State

legislators in Louisiana and simply asked them to rate the importance of a list of commonly used indicators.

The returns indicated that these legislators thought that the infant mortality rate was the most important indicator and that the number of physicians and nurses and the utilization of outpatient clinics were almost as important. Not important to the legislators were indicators such as interval since last physician visit, annual number of physician visits per person, and activity limitation by degree.

Perhaps of greater interest than the statistics from the study are excerpts from some of the letters from these Louisiana legislators:

I support health services with specifics—I leave this to the experts; in other words, I supply dollars. How they are parceled out and what the priorities are is not my decision to make.

Aside from local health problems with which I am familiar, the Louisiana health programs are presented to the Legislature on recommendation by the Governor. Only vague generalizations are used to support needed appropriations. Maybe the budget committee sees such statistics, but I haven't.

To be quite candid, none of these particular points [health indicators] were instrumental in making my decision and I have serious doubts that they were in the minds of practically any other member of the Legislature. In the short time we had, the entire Legislature was generally guided by the Governor's suggestions, the amount of allocations received during the past years, and on general advice from people such as Senator X, a good friend of mine whom I personally relied upon. This is not the best way to handle these matters . . . but we have no assistance . . . and this system just does not allow for detailed study.

It is my belief that each person has the responsibility of providing the means to pay for his own health care.

It seems unjust to me that the people of this State are taxed in order to pay for the health care of others . . . I believe that the factors listed in your questionnaire . . . are the proper concern of professionals who practice in the health field and that they are not the proper concerns of politicians. State legislators have no more business trying to run the health care business than they would in trying to run the grocery business.

Conclusions

Where does this leave the administrator, planner, or government official who must make critical decisions on the allocation of resources? Not much better or worse than he was a few years ago. How long before we will have a breakthrough, I really do not know. Some experts have suggested that if unlimited resources were available for research on health indicators, it would take 5 years to develop a reliable and valid "Consumer Price Index" of health. How valuable such an index would be is still a moot question. Some argue that it would be an important tool for setting macro-level priorities; contrariwise, since it is a macro-level tool, its value as an indicator for micro-level decisions would be limited.

Regardless, as appears evident from my preliminary survey of legislators, priorities for the allocation of health resources are being set in a less than optimum fashion. Clearly, new developments in this critical area of health services research are moving, albeit slowly, toward more sensitive and workable indicators of health status.

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